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**Building Resilient Communities
Through Disaster Mitigation**

**Planning for Natural Hazard
Mitigation in
Ontario Communities**

Acknowledgments

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Office of Critical Infrastructure Protection and Emergency Preparedness

2nd Floor, Jackson Bldg.
122 Bank St.
Ottawa, ON K1A 0W6
Tel: (613) 944-4875
Toll Free: 1-800-830-3118
Fax: (613) 998-9589
Email: communications@ocipep-bpiepc.gc.ca
Internet: www.ocipep-bpiepc.gc.ca

Author:

John Newton, Ph.D., P.Eng.
John Newton Associates
262 Robert Street
Toronto, Ontario M5S 2K8
Tel: (416) 929-3621
Fax: (416) 929-3621
Email: j.newton@utoronto.ca

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- Association of Municipal Managers, Clerks & Treasurers of Ontario
- Association of Municipalities of Ontario
- Canadian Centre of Emergency Preparedness
- Canadian Emergency Preparedness Association – Ontario Chapter
- Canadian Institute of Planners
- County Planning Directors
- Emergency Management Ontario
- Federation of Canadian Municipalities
- Institute of Catastrophic Loss Reduction
- Ministry of Municipal Affairs & Housing
- Natural Hazards Society
- Ontario Association of Chief Planning Officials
- Ontario Municipal Management Institute
- Ontario Professional Planning Institute
- Regional & Single Tier CAOs of Ontario
- Regional Planning Commissioners of Ontario

In many ways, each of these organizations was instrumental in increasing awareness of the research with their members and thus indirectly contributing to the level of response. I would also like to specifically acknowledge the assistance provided by Judith Muncaster of the Ontario Ministry of Municipal Affairs and Housing and Tracy Waddington of the Institute of Catastrophic Loss Reduction.

Executive Summary

To explore the relationship between community planning in Ontario communities and the mitigation of natural hazards to which those communities are exposed, a survey protocol was distributed to all 448 municipal jurisdictions in the province. Mailed and Internet response options were provided. Over the three month response period a total of 94 responses (21% of the total population) were received, of which 69 came by mail and 25 by Internet. The small response by Internet was surprising. Low penetration rates in northern and eastern Ontario, as well as limited response from smaller communities, weakened the database. Users are cautioned to look carefully at the specific data context before making more than preliminary observations beyond the survey sample.

From the responses, it is evident Ontario communities have a relatively high standard of community land use planning, although they do not always include thorough consideration of potential natural hazards. For many Ontario communities, linking land use planning policies and practices to the mitigation of natural hazards represents a nascent opportunity to improve economic, social, and general quality of life. In concert with new emergency management requirements in the province, greater involvement of the planning profession, and use of local planning tools, can make valuable contributions to the achievement of safer communities throughout Ontario,

The survey probed community planning practices in general, and more specifically the treatment of natural hazards. The overall average score was 30.9 out of 59, with an exceptionally wide range from zero to 49. Larger communities scored better, as did those in the southwest and central regions. The general planning sections of the survey received slightly higher average scores than those sections addressing the approach to, and integration of, natural hazards considerations. It is clear opportunities exist for enhancement of community planning processes and the integration of natural hazard mitigation within them. The relative lack of mitigation programs for natural hazards in Ontario communities supports this assessment.

The top ten natural hazards of greatest concern to the responding communities are:

- | | |
|-------------------------------|-------------------------------------|
| 1. Flood: Predicable/Seasonal | 6. Wildfire/Forest Fire/Smoke |
| 2. Freezing Rain / Ice Storm | 7. Drought |
| 3. Blizzard | 8. High Winds (110+ kph) |
| 4. Flood: Flash | 9. Lightning: Electrical Disruption |
| 5. Tornado | 10. Flood: Dam Burst |

This list provides a focal point for planning policy makers and community leaders, and raises questions. How might guidance be provided to the planning community to address exposure to these hazards? Are there hazard specific policy statements or guidelines that can be used to influence the growth and development of communities in a safer manner?

This research project was designed to both collect relevant information and educate respondents about the linkages between community planning and the mitigation of natural hazards. To that end, respondents were asked whether they might recommend and/or make changes to their

community plans as a result of gaining a greater appreciation of the subject matter through completing the survey. Forty-seven percent of respondents indicated they were likely to change current planning documents as a result of completing the survey. Furthermore, anecdotal information indicates communities will consider natural hazards mitigation in revisions to their community plans. To establish a trend in this direction, however, will require guidance and assistance, particularly funding and improved information about risks. Such requests are to be expected, especially from smaller rural jurisdictions with limited land use planning staff and capability. Local governments have responsibility for improving the safety of their citizens and overall resilience of their communities, but feel quite strongly that assistance will be required to make timely and significant progress.

The challenge communities face is to integrate concerns about natural hazards into the larger community agenda through recognition of synergistic linkages to social, economic, and environmental needs. The resulting communities will be safe, prosperous, and enjoyable places in which to live. This research provides some initial insights towards the achievement of that vision.

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1.0 Introduction

Creating safer communities in Canada requires concerted action at the local level, with guidance and support from senior jurisdictions and the full participation of each community's public and private organizations and agencies. A crucial element in achieving safe communities lies in the design and redevelopment of the built environments we live, work and play in. An initial step in this direction is to attain a better appreciation and understanding of the interactions between community planning, as it is practiced today in Ontario, and natural hazards. Current loss reduction knowledge and activities are disparate, often not understood as mitigation, and lack any method of measurement. The need to focus thinking at the community level, where mitigation happens, is apparent. Consequently, this research provides a province-wide field trail to gauge and understand the linkages between planning Ontario's communities and natural hazard mitigation. This report documents the research design proposed to undertake the field survey, discusses the research tools and presents the results of a direct mailing to each of Ontario's 448 municipal jurisdictions.

2.0 Research Rationale

The nature of the built environment that has evolved over the last half-century in Canadian communities, particularly those with current populations greater than 50,000, can be attributed to the work of community planners. In concert with political, cultural, social and the land development industry, planners have taken a lead role in shaping and guiding the evolution of Canadian towns and cities. The very process of planning requires consideration of a vast diversity of information, from the provision of supporting infrastructure to the appropriate mix and distribution of land uses. The planning process and the resultant municipal land use plans, supporting background and policy documents and zoning by-laws can either reduce or increase the vulnerability of residents and workers to natural hazards. Awareness of natural hazards and ways of mitigating their impact is therefore essential.

Evidence of the planning process incorporating consideration of natural hazards is currently anecdotal and insufficient to propose clear recommendations and policies for improved mitigation. A recognized hurdle to effective mitigation action is a lack of awareness by local planners. Previous research by the author (Newton, 2000) demonstrated that planners, among four professions involved in development, were most knowledgeable about mitigation – yet the level of awareness was still less than 50% of the planners interviewed. All communities, counties or regions in Canada, and especially in Ontario, with formal planning processes can benefit from this field trial. The research is therefore timely and highly relevant as local governments begin to place greater emphasis on creating safer communities.

3.0 Methodology

To investigate the relationship between community planning and the mitigation of natural hazards at the municipal level in Ontario communities, a straightforward survey methodology was employed. Special attention was given to the promotion of the research through various

partners to enhance the rate of response. As the quality and validity of survey results can be strongly influenced by the methodology used, particularly the approach to implementation, the methodology is explained prior to discussing the research results.

3.1 Research Protocol

As part of a previous project (Newton, 2002), the protocol for this research was designed, developed, and refined through a rigorous approach during the period May 2001 to February 2002. Building on this work the basic questionnaire template and response form were refined further and an Internet option developed to allow for on-line response.

3.1.1 Field Trial Community Planning Evaluation Template

Very minor adjustments were made to the evaluation template, including grammatical and word usage corrections. The most significant change from the final product of the previous research was the expansion of the list of supporting organizations listed on the last page (see below for details). Refer to Appendix A for the final template and Appendix B for the final response form content. Please note that the mailed version of the response form can be folded and sealed for privacy prior to mailing.

3.1.2 Field Trial Internet Option

For the Ontario Field Trail the ability to complete the questionnaire on a specially designed Web site was provided. Responders with Internet access were able to go to www.intiss.com/OntarioSurvey and complete the survey on-line. The Internet version was presented in a similar manner to the hard copy, though some additional privacy and copyright information was provided. Links to supporting organizations were provided after a submission had been made so responders would not move to other relevant Web sites prior to completing the survey. The site remained open from 1 September 2002 to 22 November 2002, a period of almost three months.

To reduce unauthorized submissions, a password was used to control access. Passwords were distributed only to the target responders. Nonetheless, the resulting data file was reviewed for duplicate or extraneous data, and minor corrections were made as required.

A responder's submission could be completely anonymous, however, at their discretion, a name and email could be provided to allow for feedback about the research findings. No link existed between the name/email and the answers to an individual submission. All on-line submissions were captured in a database for analysis.

To test the usability and flow of the Internet option, five individuals with no previous access to the on-line version were asked to explore the Web site and complete the survey. Based on the collective response, a few refinements were made. In general, they found the site easy to navigate, understand, and use.

3.1.3 Field Trial Summary Response Form

For the survey to function as a learning experience and an ongoing educational tool, it must be retained for reference. Thus a simple response form was created. The form holds the scores to each section, and a few contextual questions. Refer to Appendix B for the response form. The Response Form is printed on one sheet with instructions to fold and mail.

3.2 Supporting Organizations

To enhance the response rate to the survey a significant effort was made to contact and engage planning, municipal, and emergency management organizations, primarily, though not exclusively, with an Ontario focus. Each organization was asked if they would support the research through promotional and awareness activities with their members, provision of Web links, and the listing of their name as a supporter. All organizations contacted were helpful, within the bounds of their policies related to research, promotion, and sharing of mailing lists. This broad base of support for the research, combined with messages reaching senior municipal officials, enhanced awareness and I feel, increased the response rate. Table 1 presents the organizations participating in the research and the nature of that participation.

Table 1 Supporting Organizations

Organization	Research Partner	Promote Research	Web Link to Survey Site	Web Link to Organization
Association of Municipal Managers, Clerks & Treasurers of Ontario	Yes	Yes	Yes	Yes
Association of Municipalities of Ontario	Yes	No	No	Yes
Canadian Centre of Emergency Preparedness	Yes	Yes	Yes	Yes
Canadian Emergency Preparedness Association – Ontario Chapter	Yes	Yes	Yes	Yes
Canadian Institute of Planners	Yes	Yes	Yes	Yes
County Planning Directors	Yes	Yes	No Web site	No Web site
Emergency Management Ontario	Yes	Yes	Yes	Yes
Federation of Canadian Municipalities	Yes	Yes	No	Yes
Institute of Catastrophic Loss Reduction	Yes	Yes	Yes	Yes
Ministry of Municipal Affairs & Housing	Yes	No	No	Yes
Natural Hazards Society	Yes	n/a	Yes	Yes
Office of Critical Infrastructure Protection and Emergency Preparedness	Yes	Yes	No	Yes
Ontario Association of Chief Planning Officials	Yes	Yes	No Web site	No Web site
Ontario Municipal Management Institute	Yes	Yes	Yes	Yes
Ontario Professional Planning Institute	No	Yes	Yes	Yes
Regional & Single Tier CAOs of Ontario	Yes	Yes	No Web site	No Web site
Regional Planning Commissioners of Ontario	Yes	Yes	Yes	Yes

Where considered appropriate, each organization agreed to promote awareness of the research to their members through newsletters, email lists, Web sites, meetings, conferences, and other means available. Discussions with supporting organizations identified numerous promotional opportunities from journals to newsletters to conferences, meetings, and Web site notes. The objective was to identify at least one opportunity with each organization, though some undertook two or more during the data collection period. A sample of the awareness and promotional opportunities identified as of the end of July 2002 are noted in Table C-11. This marketing effort was considered crucial to reach the target audience of potential responders, and thus encourage municipalities to participate. Promotional efforts started approximately one week after the August 30th mailing (scheduled for delivery after the Labour Day holiday) and continued until November 22nd, the end of the data collection period.

3.3 Research Procedures

While the research delivery model must be flexible enough to respond to a variety of conditions, promotional opportunities, and perhaps even specific needs of the target population, some general operational procedures were considered essential to the effective operation of the survey tools. The following survey research procedures guided the survey implementation and data collection period:

- a) The mailing list (baseline provided by MMAH) was customized¹ to target first the Chief Planner, and then the municipal CAO, Clerk, or local administrative position.
- b) The mailing was mailed for receipt during the period September 4th to 10th.
- c) The site password was only provided in the initial mailing and upon request by telephone to pre-cleared individuals (i.e. by cross checking the mailing list and the 2002 Ontario Municipal directory).
- d) Marketing and promotion of the Internet Option commenced one week after the completion of the mailing. Material was provided to supporting organizations to suit publication/announcement deadlines.
- e) Awareness and promotion activities were only pursued between a period starting one week after mailing was complete, and finishing around November 22.
- f) The only direct follow-up during the data collection period was a reminder card sent four weeks after the initial mailing to the initial mailing list (modified with any corrections received and removal of known responses received).
- g) The on-line database holding submitted on-line responses was downloaded weekly in addition to the redundancy provided by the Web host company.
- h) Telephone interviews were not required but would have been performed on request for clearly stated reasons. Where access is available, respondents were encouraged to use the Internet Option.
- i) The data collection period terminated on November 22nd and shortly thereafter the Internet option was disabled and a general message inserted at the URL informing people of the status of the research and directing them to the Principal Investigator.

¹ Based on the 2002 Ontario Municipal Directory, Scott's Municipal Directory and current mailing lists from CIP and the following Ontario organizations: County Planners, Regional Planning Commissioners, and the Association of Chief Planning Officials.

Respondents were requested to answer questions in eight sections (see below). For the actual individual questions in each section refer to Appendix A. The initial sections dealt more with general planning practices, while the later sections included more exploration of the relationship between community planning and natural hazards:

- Section 1 – The Basics
- Section 2 – Community Support
- Section 3 – Implementation
- Section 4 – Coordination
- Section 5 – Organization & Presentation
- Section 6 – Identification of Issues
- Section 7 – Policies
- Section 8 – Quality of Data

For the purposes of this research, respondents were asked to submit their section and overall total scores, not their responses to individual questions. Upon reflection, more helpful insights into the current state of community planning in Ontario and the relationship between these activities and the mitigation of natural hazards might be realized from analysis of responses to the individual questions. Revisiting the level of detail requested from respondents prior to future use of the survey protocol is recommended.

4.0 Results and Discussion

4.1 Response Rate

Mail and Internet responses formed the database upon which the analysis is based. No information from other sources has been used or added. The analysis is based on the responses to the eleven questions appearing on the Response Form (Appendix B). Where appropriate responses have been segmented based on community population and region (see Figure 1). To allow for a more focused discussion of the research results the complete data tables are presented in Appendix C.

Based on 2002 information provided by the Ontario Ministry of Municipal Affairs and Housing the survey was sent to 448 jurisdictions in Ontario. Given the two-tier municipal structure in Ontario, with community planning responsibilities at both levels, surveys were sent to regional and county governments as well as the municipalities within those regions and counties. A total of 94 submissions were received, 69 by mail and 25 on-line. Of the 25 on-line submissions over half were received in the first four weeks. Similarly 50% of the mailed submissions arrived in the first three weeks. The remaining submissions trickled in over seven to nine weeks.

The overall response rate was 21%. For mailed surveys this is a high rate, as the normal response expected is in the five to nine percent range. The higher rate of response can in part be attributed to the awareness efforts through partner organizations and the relevance of the subject matter to municipalities. Nonetheless, the sample size is small, and the results are thus considered accurate for the full population within seven to nine percentage points 19 times out of 20.

Figure 1 Geographic Survey Regions



The rate of response was uneven by community size and location (see Table 2) with the highest level of response coming from the largest communities (44%) and from the central region (43%). Responses were low from the Northern and Eastern regions and from smaller (below 10 000) communities despite their larger absolute numbers.

Table 2 Response Rates

Factor	Community Size				Region ¹			
	<1000	1000 to 10,000	10,000 to 50,000	>50,000	NT	ET	CN	SW
Number of responses	8	33	25	28	21	13	28	32
Possible total responses	83	205	96	63	148	113	65	121
% of possible responses received	10	16	26	44	14	12	43	26

¹NT – Northern; ET – Eastern; CN – Central; SW – Southwest (see Figure 1 for the geographic scope of each region)

In Table 3 an analysis of the response rate is provided, allowing a better assessment of the level of confidence in the responses from community groups by size in each region. The highest penetration (70%) was in communities of >50 000 in the central region. Small (<1000) northern communities were not well represented (9%). Other community groups had marginal response (i.e. <1000 in the Southwest; >50,000 in the east; 10 000 to 50 000 and >50 000 in the north) or no response at all (i.e. <1000 in the eastern region).

Table 3 Percent of Total Possible Response Rated by Population and Region

Region	Community Size											
	<1000			1000 to 10,000			10,000 to 50,000			>50,000		
	n	Tn	%	n	Tn	%	n	Tn	%	n	Tn	%
Southwest	1	3	33	9	52	17	11	41	27	12	25	48
Central	0	0	n/a	7	19	37	6	26	23	14	20	70
Eastern	0	6	0	5	67	7	7	27	26	1	13	8
Northern	7	74	9	11	67	16	1	2	50	2	5	40

n = number of responses received from communities of that size in that region

Tn = total number of communities of that size in that region (Source: 2002 Ontario Municipal Directory)

% = percent of total number of responses received from communities of that size in that region

The level of penetration in a group provides an indication of where greatest weight can be given to the results provided the sample size is sufficient. The level of penetration affects the extent to which the results can be considered representative of communities of a certain size or of a certain region of the province. Consequently, data in poorly represented regions or community size groups can only be considered indicative, as it may not be representative of the whole.

4.2 Population

The smallest community to respond has a population of 417 and the largest a population of 988 945. The median population for all 94 respondents is 13 000 while the average population is 72 789, underscoring the skewed distribution of responding Ontario communities. However, this distribution is indicative of the numerous small communities in the province relative to a few large ones. Collectively the responding communities cover approximately 6.8 million people or 56% of Ontario's 2002 population of 12.1 million (Ontario Financing Authority, 2002), but this number may overestimate the actual proportion of population reflected in the responses due to the potential impact of the two-tier municipal government structure. As well, since regional governments tend to cover the more populous areas of the province the actual percent of total Ontario population covered by this research could be significantly lower than estimated. This would depend on how many regional and county governments duplicated lower tier responses. Given the confidential nature of the responses, accurate population coverage cannot be obtained.

4.3 Seven Areas of Focus

Information on community planning and natural hazards was collected in seven areas:

1. Survey section and total scores;
2. Financial support received;
3. Natural hazards mitigation programs;
4. Changes to the community plan;
5. Areas of assistance;
6. Planning staff status; and,
7. Exposure to natural hazards.

For each area, the raw data collected has been compiled and presented in Tables in Appendix C. Not all respondents answered all questions, resulting in an uneven base for certain data sets. For future survey efforts of a similar nature it is important to note that the design of the on-line survey tool enabled the detection of missed questions and prompted the respondent to provide answers. The on-line survey could not be submitted unless all questions were answered. While this approach provides a more robust data set, care must be taken to ensure a reasonable scope of responses options are provided for appropriate questions (e.g. provision of a N/A or 'Don't Know' option). Brief observations are provided in the following section on each of the seven areas with data results drawn from the tables in Appendix C as required.

4.4 Survey Section and Total Scores

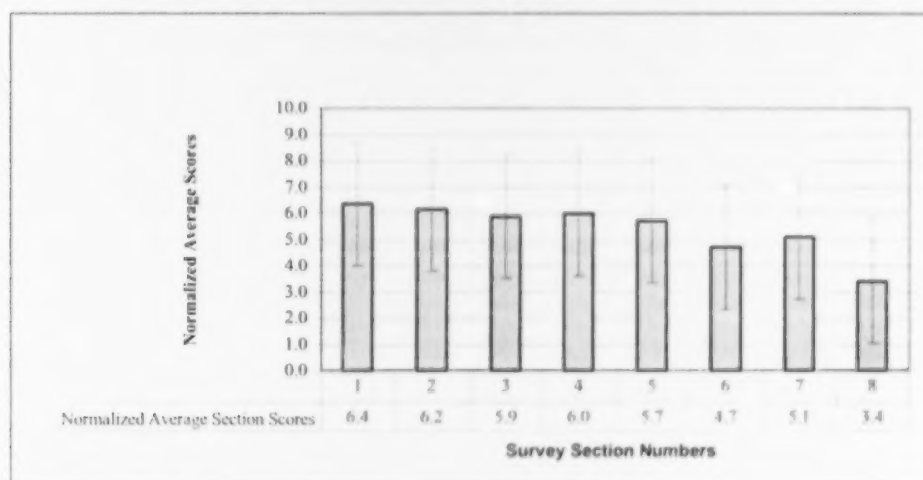
The primary focus of the Ontario Field Trail was to distribute the community planning and natural hazard survey protocol to key planning decision-makers in all municipal jurisdictions in the province. Each of the survey sections explored five to nine questions around a specific planning theme (see list below) with, where appropriate, an emphasis on the incorporation of natural hazards considerations. A brief explanation of each theme can be found at the beginning of each section in the protocol (see Appendix A).

- Section 1 – The Basics
- Section 2 – Community Support
- Section 3 – Implementation
- Section 4 – Coordination
- Section 5 – Organization & Presentation
- Section 6 – Identification of Issues
- Section 7 – Policies
- Section 8 – Quality of Data

To provide comparable data for the average section scores (see Table C-1) the data has been normalized to a base of 10 and presented in Figure 2. A representation of standard deviations is depicted in the figure (actual range of σ is ± 1.59 to ± 2.76). Sections 1 to 5 address various aspects of community and regional planning from basic plan structure to how the design and growth of a community involves stakeholder groups. While the scores indicate communities can still improve their planning in general and as related to natural hazards specifically, the overall response shows a reasonably thorough community planning capability. This indicates the reporting jurisdictions have relatively well-established planning processes in place, but that the direct inclusion of natural hazard mitigation within these planning processes is spotty to poor. In each of the first five sections however, some communities, as indicated by the deviation bars would benefit from a more comprehensive planning process. The lower values for Sections 6 to 8 are illuminating and worthy of comment as these sections probe the level of consideration of natural hazards directly. The drop-in average values from the planning sections tell us communities are less vigilant of the implications of natural hazards as an integral aspect of their planning processes.

The overall average score of 30.9 (of a possible 59) is just over 50% (see Table C-1), and indicative of the need for both improved planning and greater consideration of natural hazards in many jurisdictions.

Figure 2 Normalized Average Section Scores



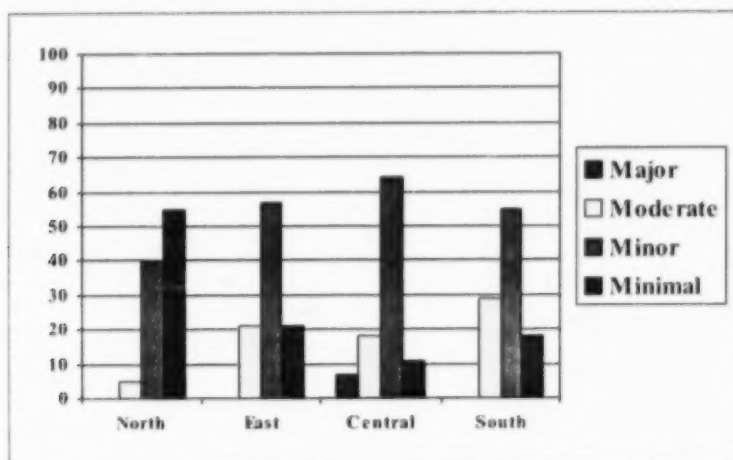
Looking more closely at the influence of community size, it is not surprising to observe that the larger communities have both higher section and total scores, as respondent communities with populations >50 000 obtaining a total average score of 35.1 (of a possible 59). This is only marginally better than the average for all submissions, but significantly higher than the average score of 21.0 for communities with populations less than 1000. However, regardless of community size the trend in scores by section from smaller to larger community groupings tended to be similar. Thus, communities without a well-established planning process appear less likely to address natural hazards in an organized manner. Given the demands placed on a community government this is not surprising, as the limited planning capacity is more likely to be directed to basic land use planning needs rather than addressing ways in which planning can be used to mitigate natural hazards.

From a regional perspective the results by section and total (see Figure 3 for percent distribution of total scores²) were quite similar for the eastern, central, and southwestern regions, with the north falling slightly behind in all sections. However, the relative values of section responses across the four regions was strikingly similar in their variation, indicating a linkage between the level of community planning and the degree to which natural hazards are incorporated into those planning efforts. It is worth observing, however, that the northern sample of responses was small (21) representing only 9% of the total northern communities. Thus, while the vast majority (141) of northern communities are less than 10 000 in population, and more than 50% are even smaller (less than 1000), the resulting northern scores may be considered indicative of the approach to planning in these smaller, often remote jurisdictions. From previous research in remote

² The meaning of the total score and a description of the four groupings (i.e. major, moderate, minor, and minimal) are explained in the "Grade Your Community" part of the survey protocol in Appendix A.

communities, the author offers the observation that care is needed in the interpretation of this data and drawing comparative assessments between distinctly different contextual environments. Indeed, a case might be made that despite the low scores from small northern communities, they may possess an equal or greater resilience to natural hazards, due to strong community cohesion, well-developed coping skills and an intimate knowledge of the land and environment in which they are located.

Figure 3 Total Scores by Region and Level



For example, attention to subtle weather or ice changes may well provide a protective capacity missing from urban environments, where the population depends more on control structures and emergency responders to ensure safety from flooding.

Numerous structural and non-structural options exist for communities to reduce their vulnerability to natural hazards, thus the scores provide a helpful indication of the limited extent to which community planning currently incorporates consideration of natural hazards. Nonetheless, regardless of community size or inherent coping capability, more formal inclusion of the consideration of natural hazards through a planning process would further enhance the overall resilience of any community. The collected data indicates the need to devote greater effort to enhancing community planning processes and incorporating consideration of natural hazards in guiding the growth and development, particularly in smaller northern communities. The evolving emergency management regulations and guidelines implementing Bill 148 represent a step in this direction³.

³ The first set of implementing regulations for the essential level of emergency management responsibilities come into effect by Order-in-Council on 4 April 2003. Subsequent regulations and guidelines will be implemented for enhanced (April 2004) and comprehensive (April 2005) levels of emergency management activity.

4.5 Financial Support Received

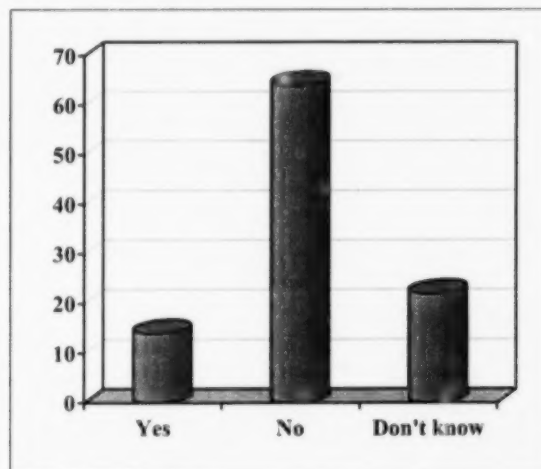
In Ontario financial support after a disaster can come from four sources, aid from individuals, other communities and NGOs often in the form of goods and services, insurance payouts, the Ontario Disaster Relief Assistance Program (ODRAP), and the federal Disaster Financial Assistance Program (DFAA). The Ministry of Municipal Affairs and Housing administers ODRAP and has provided assistance to individuals and communities after tornadoes, forest fires and floods, for example. A province accesses DFAA funds when a major loss is sustained, such as the 1998 Ice Storm. Indeed, this is the only event for which Ontario has requested federal financial assistance through DFAA. Both provincial and federal financial assistance programs have detailed criteria and interpretation of eligibility.

Consequently, communities and/or provinces may not be eligible for financial support, which is tangentially supported by the fact that only 30% of respondents have received funds in the last 20 years. Many of these requests relate, it is suspected, to the 1998 Ice Storm. As the number of respondents are small no appreciable trend emerged, and with 43% indicating they did not know if assistance had been received, drawing wider observations about financial assistance from this sample is not advisable.

4.6 Natural Hazards Mitigation Programs

Mitigation programs for natural hazards do not appear to be common among the respondent jurisdictions as only 13 communities (14%) indicated they had such a plan (see Figure 4). These communities were primarily in the central and southwest regions. Over 64% of respondents said a program was not in place and 21% did not know. This level of response would tend to indicate that responding jurisdictions were not thinking about planning their communities in such a manner as to reduce the potential losses due to natural hazards.

Figure 4 Existence of Natural Hazards Mitigation Programs



The low response may, in part, be due to a lack of appreciation of what mitigation is and whether any of the actions currently in place qualify as part of a mitigation program. For example, community planning guidelines may limit development in floodplains and adjacent to unstable slopes. Both these actions would constitute elements of a mitigation program. Previous research by the author investigating the level of understanding of mitigation among groups (e.g. developers, architects, planners, and administrators) responsible for community development revealed quite a low appreciation and understanding of the meaning and application of mitigation programs and policies. Whether a more detailed explanation would result in a significant change is doubtful, though slight adjustments might be expected.

Nonetheless, the evidence indicates that mitigation programs directed to reduce the impact of natural hazards are not widespread across the province and that opportunity exists to put such plans in place. These opportunities do not appear dominant within a particular community size or region, suggesting existing plans were likely event-driven. The focus of a particular mitigation program should be responsive to the natural threats a community is exposed to, underlining the value and need for effective community-specific hazard identification and risk assessment⁴.

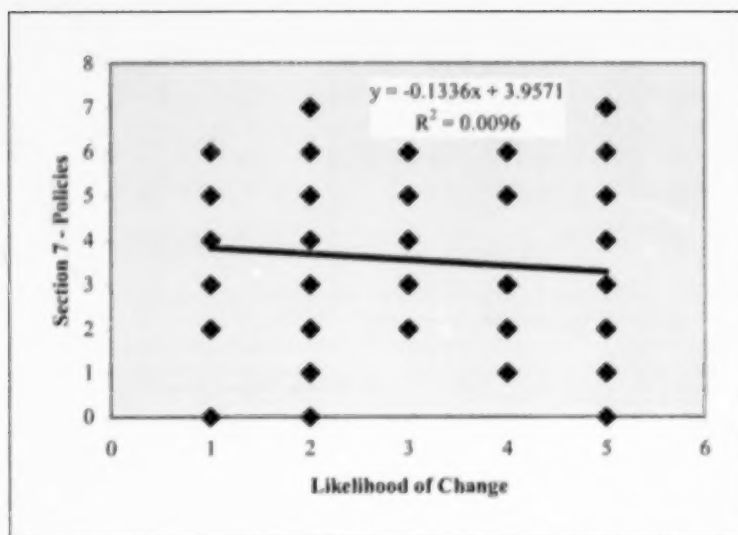
4.7 Changes to the Community Plan

In any area, awareness and education represent the first step towards initiating changes. This research project was designed to both collect relevant information and educate respondents about the linkages between community planning and the mitigation of natural hazards. To that end, respondents were asked whether they might recommend and/or make changes to their community plans as a result of gaining a greater appreciation of the subject matter through completing the survey. Here, 47% of respondents indicated they were very or somewhat likely to make changes, whereas 35% indicated they were somewhat or very unlikely to make any changes, and 18% were undecided. Southwestern and northern communities were more likely to implement changes, while central communities were the most unlikely to make changes.

With respect to community population the responses tend to be more evenly distributed among the population groups when comparing the likelihood to take action or not. Again, it is worth noting that with a sample size of 94 the distribution can be thin across an analytical matrix, reducing the ability to see clear trends and underlining the fragility of the data to a few responses. For smaller samples, aggregate data is more helpful and the finer analysis is indicative rather than definitive.

⁴ Under new legislation (Bill 148) and the implementing regulations, performing a hazard identification and risk assessment project is a requirement for every jurisdiction in Ontario.

Figure 5 Policies vs. Likelihood of Change



Where communities do not have strong or comprehensive planning policies to address the natural hazards to which they are exposed – and all responding communities indicated they were exposed to some of the natural hazards listed (see Section 4.9) – do communities see a need to change their current planning documents? While not an overwhelming vote for immediate change, the distribution is interesting, though a positive correlation would be more encouraging, Figure 5 shows that there is no relationship between the extent of current natural hazard policies in place and the likelihood of making changes to current community plans. What then would encourage 47% to consider changes? If a recognition of the need to make changes in planning documents is not clearly linked to the current level of relevant natural hazard planning policies, as the data shows, can we determine from the data collected what drives the awareness that changes are needed?

Perhaps community decision-makers are willing to act when presented with compelling information about the potential vulnerability of their community. Or will the level of current community planning influence this response, or perhaps the presence of existing natural hazard mitigation programs? As presented in the figure above, mining the data in these areas shows similar results that do not demonstrate a relationship. The important observation is that some respondents are willing to consider planning changes to reduce the vulnerability of their citizens for reasons the collected data cannot tell us. The fact that community planning officials are now considering possible mitigation actions (that they might not have taken had they not participated in the research) is encouraging. One can also speculate that such observations raise the possibility that recipients of the survey who did not respond might use the ideas and concepts embedded in the questions to make changes to their planning documents. Awareness leading to action can be incremental, with the survey functioning as one catalyst in a long-term process leading to change in community planning policy.

4.8 Areas of Assistance

Communities will act in the best interest of their citizens, but may require assistance and guidance to do so effectively. Respondents were asked to rate 14 types of assistance that might be provided, including such help as legislative changes, additional funding, and training (for a full list of items see Table C-6 in Appendix C) on the following scale:

1 = A major help; 2 = A moderate help; 3 = A minor help; 4 = A minimal help; or 5 = No help.

Not surprisingly, the median value for all types of assistance ranked either major (1) or moderate (2), indicating a strong request for assistance and guidance with the incorporation of natural hazard concerns into their community planning processes, regardless of the type of assistance. The need for assistance was consistent across all community sizes with relatively minor variations. Where the average ratings across the population groups or regions fall in a narrow band (± 0.5) there is a strong indication that those types of assistance are not influenced by community size or geographic location. Furthermore, the feelings among respondents do not vary significantly, though there were the occasional outliers as indicated by the range column which shows the maximum spread (1–5) for all but three items. So there are some communities who feel certain types of assistance are not required, but they are clearly in the minority.

The following four types of assistance received the highest average ratings from respondents (the ratings and their standard deviations are given in brackets):

- Additional funding (1.5; $\sigma = \pm 0.95$)
- Additional or improved mapping (1.6; $\sigma = \pm 0.79$)
- Additional or improved risk data (1.8; $\sigma = \pm 0.90$)
- Technical assistance (1.8; $\sigma = \pm 0.91$)

One other item, "additional staffing" received a high average rating (2.0), but exhibited spreads of greater than 0.5 in both population and region groupings, indicating differences of opinion among respondents. A larger data set would allow for more definitive conclusions about the most beneficial types of assistance. However, from all 94 respondents, the message that assistance of all types is needed for communities to better incorporate natural hazards into community planning remains clear, and is validated by overall data presented in Table C-6. Such a position is to be expected from municipal jurisdictions that over the past eight years have experienced unprecedented downloading of responsibilities, straining budgets, and demand for staff time.

4.9 Planning Staff Status

Community land use planning requires knowledge and experience gained through study, training, and practice, which can be most easily recognized in Canada through membership in the Canadian Institute of Planners (CIP). Membership in CIP is not a requirement to assume community planning responsibilities, but eligibility is often stated as a basic job requirement. Formal membership in this planning association through the provincial chapter in Ontario – the Ontario Professional Planning Institute (OPPI) – demonstrates an individual commitment to the

field and an active interest in the evolution of planning practice that comes from association conferences, workshops, and journals.

Of the survey respondents 71% indicated planning staff were members of CIP (see Table C-7). Communities without CIP members on staff were primarily in smaller jurisdictions (>10 000), which is understandable, as many of these administrations may not have a formal planning function with full time staff. Indeed, the statistics on full time land use planning staff provided by respondents (see Table C-8) parallels very closely the CIP membership data whether viewed by population or regional distribution. For both CIP membership and full-time status the "yes" responses were very strong in the central and southwestern regions, and weaker in the eastern and northern regions where the communities are predominantly smaller and less likely to have dedicated planning staff. These observations are indicative only, as the sample sizes for northern and eastern regions were low relative to the total communities in their geographic region. A relationship does exist between membership in CIP and full-time status, though it is not as strong as might be expected from the data in Tables C-7 and C-8. Clearly, some communities have part-time planning staff who are CIP members and some communities have full-time planning staff who are not members of CIP.

In the absence of full-time qualified planning staff in a community the chance that the mitigation of natural hazards will be addressed in a formal, direct manner is greatly reduced. We cannot state that such activity will not occur, especially where a clear natural threat is identified (e.g. flood, forest fire, landslide, etc.), and well-qualified external planning services are available, but the likelihood does become less probable.

4.10 Exposure to Natural Hazards

To obtain an appreciation of the natural hazards to which communities in Ontario are exposed, a list of 29 natural hazards was presented to respondents (see Appendix B, Question 11). Each respondent first marked the hazards they felt their community had experienced. The summary for 94 communities is presented in Table C-9 in absolute numbers and by community size and region.

The three natural hazards most frequently reported by respondents were: (1) Freezing Rain / Ice Storm; (2) Blizzard; and, (3) Flood: Predicable/Seasonal. None of these hazards is surprising and all have a long and frequent history of occurrence throughout Ontario, although the awareness of, and sensitivity to, ice storms may well have been influenced substantially by the 1998 Ice Storm in eastern Canada. In Ontario freezing rain, like blizzards or spring flooding, are accepted aspects of local climate. Communities understand these hazards and have been quite successful in coping with them when they occur. The top ten natural hazards to which respondent communities have been exposed to are listed in Table 4. While the order may change slightly with a larger sample, the commonality of weather patterns across the different regions of the province would point towards a similar listing, even with a higher representation of smaller northern communities, which are currently under-represented. A comprehensive listing based on

input from all Ontario communities would yield a valuable appreciation of community experience with natural hazards in Ontario⁵.

Table 4 Top Ten Natural Hazards Experienced by Responding Communities

Rank	Natural Hazard	Percent of Responding Communities
1	Freezing Rain / Ice Storm	79
2	Blizzard	70
3	Flood: Predicable/Seasonal	67
4	High Winds (110+ kph)	60
5	Lightning: Electrical Disruption	59
6	Fog	52
7	Hail	49
8	Frost	45
9	Cold Wave	44
10	Heat Wave	41
Base=94		

While not true of all groups, the sample size was large enough for central and southwestern regions and for communities greater than 50 000. These columns in Table C-9 provide a reasonable reflection of the likely response from the total population in those groupings. The ranking within each of these groups closely parallels the list in Table 5, though the order varies somewhat. Outliers worthy of mention are "Lightning: Fire" and "Wildfire/Forest Fire/Smoke" as they rank at or near the top for small northern communities, though are ranked lower for all respondents in the province. An increase in the overall response rate, especially from small northern communities, would likely result in the rise of "Wildfire/Forest Fire/Smoke" from #15 into the top ten.

From the natural hazards to which a community was exposed, respondents were asked to identify the two natural hazards of greatest concern (see Table C-10). Of the 94 respondents 67 answered this question in whole or in part. The two-part design of Question #11 on the Response Form may have confused some respondents, resulting in a lower response rate, however with 71% responding, other factors may have been involved. Table 5 presents the hazards identified to be of greatest concern, which includes six of the natural hazards in the top ten ranked by general exposure. However, four hazards – Flood: Flash; Tornado; Drought; and, Flood: Dam Burst – have moved up from lower general rankings.

⁵ Under Bill 148 all Ontario communities will be required to perform hazard identification and risk analysis. Depending on the depth and consistency of approach to this work the resultant information collected by Emergency Management, Ontario could provide a valuable comparison to the results of this research.

Table 5 Top Ten Natural Hazards of Greatest Concern to Responding Communities

Rank	Natural Hazard	Percent of Responding Communities
1	Flood: Predicable/Seasonal	31
2	Freezing Rain / Ice Storm	26
3	Blizzard	16
4	Flood: Flash	14
5	Tornado	12
6	Wildfire/Forest Fire/Smoke	11
7	Drought	6
8	High Winds (110+ kph)	4
9	Lightning: Electrical Disruption	4
10	Flood: Dam Burst	3
Base=94		

From land use and emergency planning perspectives, these events begin to provide a focus for action, as they represent the types of events communities are concerned about. Communities may well be exposed to and experience other natural hazards, but they are less concerned about them, perhaps due to adaptation over years of experience or well-established coping and response procedures that instil confidence.

4.11 Interest in Results

Respondents were able to indicate on their response form if they wanted to receive follow-up information. This was done in order to enhance learning and advance the discussion of community planning and natural hazards in Ontario. In total, 59 respondents (63% of all submissions) requested follow-up information of which 56 provided email addresses, indicating quite a high level of interest. This list will be used to provide the interested individuals with a link to OCIEP's Research and Development publications Web page when this report is publicly available. As awareness represents the first step towards change, the provision of additional information in this manner will help to build a better appreciation of the potential linkage between community land use planning and natural hazards in Ontario's planning community.

5.0 Conclusions

Engagement of supporting organizations was crucial to the survey response rate. Without the wide range of promotional and awareness actions, utilizing established communications channels to reach the target audience, participation would have been substantially lower. The low number of on-line responses, given the assumed ubiquity of Internet access, was surprising. People appear more comfortable with the paper form rather than the Web version. Apparently the on-line option was perceived as more difficult or complex, when in fact it is quicker and more efficient. Migrating towards electronic survey tools has numerous advantages from the data collection and analysis perspective. However, while proficiency in email is rising rapidly, the use of other on-line tools and processes appears to have a much lower penetration rate among municipal users. There may well be other reasons, but the disparity in the submission mode of choice cannot dismiss the apparent existence of a technological barrier.

Moreover, the low penetration rates in northern and eastern Ontario as well as limited response from smaller communities weakened the data and require users to look carefully at the specific data context before making more than preliminary observations. Any statements about populations larger than the sample analyzed must be stated carefully and with appropriate caveats. By comparison larger communities in central and southwestern Ontario were well-represented, making their data more meaningful. Strong relationships were not evident in the data sets, perhaps due to sample size, but more likely the diverse range of responses received from communities that are reflective of their individual situations and approaches to community planning and natural hazards. Drawing more definitive observations about how Ontario's 448 jurisdictions incorporate natural hazards into community planning requires a more comprehensive level of response, especially in the eastern and northern regions of the province.

Communities generally have a high standard of planning (somewhat less so in many smaller and northern communities), though the presence of specific natural hazards considerations is lower across all regions and community size groups despite the recognition that their communities are affected by natural hazards. While some may not be aware of existing policies and actions to mitigate natural hazards, many more communities may see such events as emergency response issues and not have considered community and land use planning as tools to reduce potential losses. The relative lack of mitigation programs for natural hazards in Ontario communities would begin to support this assessment.

Another objective of this research was to begin to educate, and thus influence changes in community planning practices. If respondents act in accordance with their responses then this objective will have been met, at least partially. Anecdotal information received through third parties indicates that at least two communities will address natural hazards directly in current revisions to their community plans. Evidently more would be willing to undertake similar commitments, but they feel quite strongly that assistance is required, particularly funding and improved information about risks. Some guidance will likely result for the active advancement of emergency management practices in all Ontario communities following the approval in late 2002 of Bill 148.

The list of natural hazards of greatest concern provides community planning policy makers with a focal point for their thinking. How might guidance be provided to the planning community to address exposure to these hazards? Are there hazard specific policy statements or guidelines that can be used to influence the growth and development of their communities in a safer manner? As we have seen in the section and total scores, leaders still have a substantial opportunity to build more resilient communities, but require assistance and guidance. Why? Because many smaller communities are not highly skilled in land use planning, thus achieving a basic planning framework and implementing controls represents a significant and laudable achievement. This will change – slowly – and with that change will come hopefully greater attention to natural hazards, the threat they pose to community sustainability, and the opportunities that exist to mitigate their impact.

Collection of responses from all respondents to the 59 core questions would take the research to a higher level of specificity and significantly enhance the analytical capability, leading to a more detailed understanding of community planning practices and the incorporation of natural hazards mitigation. While not part of this project, such research would be a worthwhile undertaking to highlight specific strengths and weaknesses in the current application of planning processes in Ontario, and identify where and how, within these processes, consideration of natural hazards could be integrated.

Building resilient communities is a responsibility we all share, as leaders, workers, and citizens. It is evident from this research that some communities are leading the way, charting a course for others to learn from and follow. The challenge communities face is to integrate concerns about natural hazards into the larger community agenda, amid numerous competing priorities, and come to appreciate the synergistic possibilities with other social, economic and developmental agenda items. Safe communities will prosper and be enjoyable places in which to live. The information presented in this document is meant to help achieve that vision.

6.0 References

- Newton, John. 2000. "An Exploration of Mitigation in Canada – Perceptions, Attitudes & Ideas." Office of Critical Infrastructure Protection and Emergency Preparedness: Ottawa.
- Newton, John. 2002. "Community Planning for Natural Hazards." Office of Critical Infrastructure Protection and Emergency Preparedness: Ottawa.
- Ontario Financing Authority. 2002. "About Ontario." <http://www.ofina.on.ca/ontario.html> (1 July 2002).

Appendix A – Research Questionnaire

Introductions

As a senior community official or planner, your work in land use planning is critical to the health and future of your community – economically, socially, and environmentally. The work you do affects the vulnerability of your community to natural disasters – flood, wildfire, earthquake or similar events – that are beyond your capacity to cope. Whether your community has experienced an incident or not, risk management is a responsibility we all share.

This research is supported by the organizations listed on the back page and on the research Web site (www.intiss.com/OntarioSurvey). Together with you, these organizations share the vision of safer, sustainable communities throughout Canada that are more resilient to the natural disasters that do occur. The results of this research will help raise awareness about how local planning and development practices can help reduce losses due to natural hazards.

Why is this important? Natural disasters cause annual losses of millions of dollars in Canada and directly impact the lives of thousands of Canadians. Please contribute to making our communities safer from natural disasters by sharing your knowledge. Not only will your responses provide a better understanding of how well community regulatory tools address natural hazard concerns, but they also will help senior community leaders and planners protect communities.

INSTRUCTIONS

The questionnaire has eight sections, designed to allow planners to evaluate how well their communities have integrated disaster loss reduction principles into their comprehensive planning documents and policies. Each section contains a series of questions with “yes” or “no” answers. Each section is scored and all eight sections are totaled to determine a final grade. A person familiar with his or her local planning practices should be able to complete the questionnaire in less than 25 minutes (Note: The on-line version requires even less time due to automated functions).

Internet On-Line Option: If you have Internet access, please go to www.intiss.com/OntarioSurvey and complete the survey on-line. The Survey Access Code is **JNA2002**. Or if you prefer, follow the steps below to use the hard copy provided.

- Step A** – Read through the questionnaire and check “yes”, “no”, or “n/a (not applicable)” for each question, totaling each section score.
- Step B** – Add the section scores to determine your total score.
- Step C** – Fill out the enclosed response form with your section scores, total scores, and responses to the other ten questions. If you would like to receive notification about the research results, fill out the optional contact information in Question #12.
- Step D** – Keep the questionnaire booklet for your reference, and return the response form by mail or fax to John Newton Associates. Your answers are confidential and will be released only as summaries in which no individual’s answers can be identified.

Thank you very much for helping with this important research.

SECTION 1 – THE BASICS

Every community that is subject to natural hazards should have a comprehensive community plan that incorporates basic planning principles for natural hazard mitigation to minimize the loss of lives and property. Examples of natural hazards to consider in developing community plans include: earthquakes, floods, landslide/unstable slopes, wind, and wildfire.

- | | | |
|--|------------------------------|-----------------------------|
| 1.1 Does your community/jurisdiction have an approved comprehensive community land use plan or similar document (hereafter referred to as your "Plan")? | ☐ Yes | ☐ No |
| 1.2 Does the Plan and/or internal community policy documents or programs contain an overall statement summarizing the broad goals and guidelines for the community to address natural hazards and mitigate their effects? | ☐ Yes | ☐ No |
| 1.3 Does your community have other background documents or policies (<i>e.g. studies, reports, task force investigations, or other documents that support, but are not a formal part of the approved comprehensive plan</i>), aside from emergency preparedness plans, that address natural hazards? | ☐ Yes | ☐ No |
| 1.4 Does the Plan or Policies identify measurable natural hazard mitigation objectives, so the community can measure the level of achievement?
<i>Examples: maximum allowable density in a hazard-prone area; number of public and historic buildings seismically strengthened; or transportation systems that accommodate evacuation within a set number of hours.</i> | ☐ Yes | ☐ No |
| 1.5 Does your community have one or more people dedicated to preparing plans and addressing community land use planning issues? | ☐ Yes | ☐ No |
| 1.6 Has your legal counsel reviewed the Plan prior to adoption by by-law? | ☐ Yes | ☐ No |
| 1.7 Has the Plan had a full review and assessment within the last five (5) years? | ☐ Yes | ☐ No |

Add up the number of Yes answers in Section 1 and place it in the shaded box.....

Score

1

SECTION 2 – COMMUNITY SUPPORT

Community-wide involvement in preparing your comprehensive community Plan encourages stakeholder buy-in and support, increasing the effectiveness of the resulting documents. Ongoing outreach after approval helps educate all stakeholders about the critical role of community planning and builds support for loss reduction activities.

- | | |
|---|--|
| 2.1 Did preparation of your community's Plan and supporting background documents include consultation with a broad base of the community, such as public officials, citizen groups, civic organizations, businesses, and adjacent jurisdictions? | ☐ Yes ☐ No |
| 2.2 Were citizens involved up-front in identifying issues to be addressed in the Plan? | ☐ Yes ☐ No |
| 2.3 Is funding available to support the active participation of local community and neighbourhood groups in the Plan development process? | ☐ Yes ☐ No |
| 2.4 Were citizens given information about natural hazards during the Plan and/or supporting background documents preparation process? | ☐ Yes ☐ No |
| 2.5 To get community-wide participation, did you use neighbourhood meetings, citizen panels, focus groups, or official commissions? | ☐ Yes ☐ No |
| 2.6 Is your community's Plan and supporting background documents available on your web site and/or as reference documents in local libraries? | ☐ Yes ☐ No |
| 2.7 After adoption of your community's Plan, do professional planners continue to educate the public by providing guidance and information about natural hazard vulnerabilities, the way these hazards affect your community and the importance of planning to mitigate their impact? | ☐ Yes ☐ No |

Add up the number of Yes answers in Section 2 and mark it in the shaded box.....

Score

2

SECTION 3 – IMPLEMENTATION

Meaningful implementation of the objectives outlined in your community's Plan requires appropriate financial and human resources and legal authority. The vision and planning framework embodied in the Plan must be translated with conviction and commitment, from concept to reality through accepted legislative tools and planning practices.

- | | | | |
|-----|--|---------------------------------|--------------------------------|
| 3.1 | Do your Plan's goals and objectives related to natural hazards result in specific action plans, rather than statements of general intention? (e.g. <i>a specific action: no further development proposals approved within the 40-year coastal erosion zone. General intention: to reduce the risk of flooding.</i>) | ☐
Yes | ☐
No |
| 3.2 | Does your Plan include an explanation of how it, and other related policies, are to be implemented? | ☐
Yes | ☐
No |
| 3.3 | Does your Plan identify the agencies/organizations who have responsibility for implementing policies in the Plan or other related documents? | ☐
Yes | ☐
No |
| 3.4 | Does your Plan include timelines for implementation? | ☐
Yes | ☐
No |
| 3.5 | Does your Plan describe procedures for monitoring and evaluating the implementation of the Plan or related policies? | ☐
Yes | ☐
No |
| 3.6 | Has your community received support from the provincial / territorial and/or regional levels of government in facilitating the implementation of your community's Plan and/or related policies? | ☐
Yes | ☐
No |
| 3.7 | Does provincial/territorial or local law require that zoning decisions and subdivision approvals conform to your Plan or other land use policies? | ☐
Yes | ☐
No |
| 3.8 | Does provincial/territorial or local law require that capital improvement and capital budget decisions be in conformance with your Plan? | ☐
Yes | ☐
No |
| 3.9 | Once your Plan was approved were budgeting arrangements established for implementation? | ☐
Yes | ☐
No |

Add up the number of Yes answers in Section 3 and place it in the shaded box.....

Score

3

SECTION 4 – COORDINATION

Your Plan should integrate key recommended actions from other plans, policy instruments and background documents that are authored both inside and outside your community. Natural hazards do not respect community boundaries. *If your region, province, territory, or neighbouring communities do not have planning guidelines, check the "n/a" box for the appropriate questions.*

- | | | | | |
|-----|---|---------------------------------|--------------------------------|---------------------------------|
| 4.1 | Are your Plans and supporting documents consistent with provincial / territorial guidelines or principles for areas subject to natural hazard? | ☐
Yes | ☐
No | ☐
n/a |
| 4.2 | Are your Plans and supporting documents consistent with upper tier regional plans and policies? | ☐
Yes | ☐
No | ☐
n/a |
| 4.3 | Does your community have a formal process to ensure, that with respect to common natural hazards, your Plans and supporting documents are consistent with the plans or procedures of adjoining communities? | ☐
Yes | ☐
No | ☐
n/a |
| 4.4 | Does your community have a formal negotiating process with other levels of government to coordinate plans and policies addressing the management and mitigation of natural hazards? | ☐
Yes | ☐
No | |
| 4.5 | Does your Plan or supporting documents recognize the potential impact of actions in non-adjoining communities? (<i>e.g. contamination of aquifers, pollution of waterways, changes to water flow volumes</i>) | ☐
Yes | ☐
No | ☐
n/a |
| 4.6 | Are your Plans and supporting documents consistent with the plans or procedures of overlapping jurisdictions? (<i>e.g. school board, utility, fire, park, or transportation authorities</i>) | ☐
Yes | ☐
No | |
| 4.7 | Does your community have formal mutual aid or operational assistance agreements with other communities? | ☐
Yes | ☐
No | |
| 4.8 | Are your Plans and supporting documents consistent with other plans and documents internal to the community? (<i>e.g. emergency response plan</i>) | ☐
Yes | ☐
No | |

Add up the number of Yes and n/a answers in Section 4 and place it in the shaded box.....

Score

4

SECTION 5 – ORGANIZATION & PRESENTATION

The Plan and all supporting documents should be readable, comprehensible, assessable, and easy to use by citizens, decision-makers and other stakeholders.

- | | | | |
|-----|--|---------------------------------|--------------------------------|
| 5.1 | Is a detailed table of contents included (not just a list of chapters) that presents your Plan's contents in a consistent and organized manner? | ☐
Yes | ☐
No |
| 5.2 | Is a glossary of terms and definitions included? | ☐
Yes | ☐
No |
| 5.3 | Is your Plan and supporting documents clearly written in plain language that avoids ungrammatical, wordy, jargon-filled, or unclear statements? | ☐
Yes | ☐
No |
| 5.4 | Do the maps required in your approved Plan illustrate spatial information clearly? | ☐
Yes | ☐
No |
| 5.5 | Is there a separate summary document for general public distribution? | ☐
Yes | ☐
No |
| 5.6 | Do the public documents supporting your Plan illustrate the meaning and intent of the planning policies with diagrams, charts and pictures? | ☐
Yes | ☐
No |
| 5.7 | Are supporting documents clearly and consistently referenced in your Plan?
<i>For example: other plans and background studies, data, web pages.</i> | ☐
Yes | ☐
No |
| 5.8 | Is your Plan and supporting documents available on your municipal web site and in CD-ROM format for easy use and reference by interested stakeholders? | ☐
Yes | ☐
No |

Add up the number of Yes answers in Section 5 and place it in the shaded box.....

Score

5

SECTION 6 – IDENTIFICATION OF ISSUES

Comprehensive community Plans and/or supporting documents often explain why the planning and development issues they raise are of significance, to the community at large and to individuals within the community. Such information provides citizens and decision-makers with a helpful context for supporting and implementing relevant planning goals and objectives.

- | | |
|---|--|
| 6.1 Does your community's Plan or supporting background documents address the rights and responsibilities of property owners? <i>Example: Maintain topography of flood plain on property.</i> | ☐ Yes ☐ No |
| 6.2 Do supporting background documents to your community's Plan discuss the importance of loss reduction to the overall health of the community? <i>Example: An explanation of the environmental, social and/or economic consequences of failing to address the potential impacts of natural hazards.</i> | ☐ Yes ☐ No |
| 6.3 Does your community's Plan or supporting background documents identify alternatives for development of land within designated hazard areas? <i>Examples of alternatives might include high density or cluster zoning, transfer of development rights, impact fees, or structural protection.</i> | ☐ Yes ☐ No |
| 6.4 Does your community's Plan or supporting background documents discuss the standards and criteria for acceptable risk, even if set by another body? <i>For example, references to standards for flood protection, for stormwater management or for required setbacks from specific hazards.</i> | ☐ Yes ☐ No |
| 6.5 Does your community's Plan or supporting background documents discuss the environmental consequences of structural mitigation activities? <i>For example, using dykes to control flood waters, or channelizing creeks and streams.</i> | ☐ Yes ☐ No |

Add up the number of Yes answers in Section 6 and place it in the shaded box.....

Score

6

SECTION 7 – POLICIES

A policy statement must be based on a sound rationale supported by facts and relevant data. The policies developed to guide land use in a community reduce risk of loss and enhance safety when they incorporate consideration of the natural hazards the community faces.

- | | | | | |
|-----|--|---------------------------------|--------------------------------|---------------------------------|
| 7.1 | Does your Plan or supporting documents include policies to designate areas of high vulnerability to natural hazards for limited development? (<i>e.g. cluster zoning to keep structures from being built in floodplains, zone area for recreational or open space, land acquisition of high hazard areas.</i>) | ☐
Yes | ☐
No | |
| 7.2 | Do the property tax policies or procedures effective in your community result in a lower property tax on land which is vulnerable to natural hazards and is either undeveloped or developed at less than permissible density? | ☐
Yes | ☐
No | |
| 7.3 | If your community has geo-technical faults, unstable slopes, shores or soils, erosion-prone dunes, wetlands or flood-prone areas, does the Plan or background documents include policies to set new development back from these areas or to establish a buffer zone around these areas? | ☐
Yes | ☐
No | ☐
n/a |
| 7.4 | Does your community have an implicit policy to steer capital improvements away from the areas of the community/region vulnerable to natural hazards? (<i>If natural hazard(s) of concern affect your whole community/region mark n/a.</i>) | ☐
Yes | ☐
No | ☐
n/a |
| 7.5 | Does your community's Plan or supporting documents have policies (<i>e.g. retrofit or relocation</i>) to reduce the vulnerability of existing development in hazardous areas? | ☐
Yes | ☐
No | |
| 7.6 | Does your community have a policy to acquire land in vulnerable areas and designate it permanent open space to protect it from development? | ☐
Yes | ☐
No | |
| 7.7 | Does your Plan or background documents include policies for reassessing risks to the community following a disaster due to a natural hazard? | ☐
Yes | ☐
No | |
| 7.8 | Does your Plan or supporting documents have a policy calling for ongoing public education about and awareness of natural hazard vulnerabilities? | ☐
Yes | ☐
No | |

Add up the number of Yes and n/a answers in Section 7 and place it in the shaded box.....

Score

7

SECTION 8 – QUALITY OF DATA

Your community Plan or supporting documents should incorporate or reference factual data, including maps, which explain current conditions, trends and likely future conditions. These documents should also make formal reference to hazards that may threaten your community.

- | | | | | |
|-----|---|---------------------------------|--------------------------------|---------------------------------|
| 8.1 | Does your community's Plan or supporting background documents describe disasters experienced by the community, including their effects and costs?
<i>(If your community has not experienced a natural disaster mark the n/a box.)</i> | ☐
Yes | ☐
No | ☐
n/a |
| 8.2 | Do the background documents supporting your community's Plan include a risk and vulnerability assessment <i>(e.g. extent, severity, frequency, etc.)</i> of the natural hazards of greatest threat to your community? | ☐
Yes | ☐
No | |
| 8.3 | Does your community's Plan or supporting background documents include maps that identify areas subject to natural hazards <i>(e.g. flood zones, unstable slopes, coastal zones, etc.)</i> ? | ☐
Yes | ☐
No | |
| 8.4 | Are there maps in your community's plan or supporting background documents that identify vulnerable buildings, essential services (such as water, sewer and electrical lines) and critical facilities (such as hospitals, fire stations)? | ☐
Yes | ☐
No | |
| 8.5 | Does your community's Plan or supporting background documents include tables that provide data on vulnerable populations and buildings in the community? | ☐
Yes | ☐
No | |
| 8.6 | Do the background documents supporting your community's Plan include an estimate of losses that may result from development proposed on land subject to natural hazards? <i>(If no area proposed for development in your community is exposed to natural hazards mark the n/a box.)</i> | ☐
Yes | ☐
No | ☐
n/a |
| 8.7 | Has the data on natural hazards used in your community's Plan or supporting background documents been prepared and/or verified by an accepted professional or public agency? | ☐
Yes | ☐
No | |

Add up the number of Yes and n/a answers in Section 8 and place it in the shaded box.....

Score 8

GRADE YOUR COMMUNITY

Step A – Write the score from each section of the survey in the corresponding shaded area below.

Step B – Tally up your total score for all sections.

Step C – Use this information to **fill out the Response Form**

Step D – Mail the Response Form back to John Newton Associates (*already addressed*).

Keep the questionnaire booklet for your reference.
Thank you for participating in this research.

What does your total score mean?

Your total score provides an indication of the degree to which planning in your community addressed natural hazards, or has the planning framework to better incorporate further attention to the risk natural hazards pose for all community members. The categories below indicate the general range in level of effort.

Major (47-59) - Your community does an excellent job of addressing its natural hazard vulnerabilities in its land use plan and policies. Congratulations!

Moderate (38-46) - Your community does a good to very good job. While there is room for improvement, community leaders can justifiably be proud of their work to minimize losses and maximize safety.

Minor (26-37) - Your community does an adequate to good job. With this much done, the community should now step up its efforts to improve weak areas.

Minimal (0-25) - Your community does a nominal job and can do much better. The community should organize an overhaul of its plan and policies to incorporate natural disaster loss reduction principles appropriately.

Now Take Action: Review your scores and identify actions your community can take to reduce its vulnerability to natural hazards. Seek assistance from local organizations and agencies or contact those groups listed on the back page.

Section	Scores
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____

Total	_____
--------------	-------

QUESTIONNAIRE AND RESPONSE FORM

Thank you for completing the Community Planning for Natural Hazards questionnaire. **Please fill out the enclosed response form and return it to John Newton Associates today.** Your response is important to help Canadian communities learn more about community planning practices for natural hazards.

Where to Get More Information

For more information about natural hazards and local planning practices contact any of the relevant local and provincial/territorial agencies and organizations that are familiar with your community. For general information contact:

Association of Municipal Managers, Clerks, and Treasurers of Ontario	(905) 602-4294 ext.26
Canadian Centre for Emergency Preparedness	(905) 319-4031 • www.ccep.ca
Canadian Emergency Preparedness Association – Ontario Chapter	(519) 575-4740 • www.cepaontario.ca
Canadian Institute of Planners	(800) 207-2138 • www.cip-icu.ca
County Planning Director of Ontario	(705) 743-0380 ext.315
Emergency Management Ontario	(416) 314-8622 • www.solicitorgeneral.msg.gov.on.ca
Federation of Canadian Municipalities	(613) 241-5221 • www.fcm.ca
Institute of Catastrophic Loss Reduction	(416) 362-2031 • www.iclr.ca
Natural Hazards Society	(204) 474-8375 • www.brandonu.ca/nhs/
Office of Critical Infrastructure Protection and Emergency Preparedness	(613) 991-7035 • www.ocipep-bpiepc.gc.ca
Ontario Chief Planning Officials Association	(905) 896-5561
Ontario Municipal Management Institute	(905) 434-8885 • www.ommi.on.ca
Regional & Single Tier CAOs of Ontario	(905) 825-6200
Regional Planning Commissioners of Ontario	(905) 686-1651 ext.3231 • www.rpco.on.ca

FEEDBACK ON THIS FORM

We invite questions and comments on this form and the research in general. Contact us by:

1. Calling John Newton Associates at (416) 929-3621.
2. Sending email to j.newton@utoronto.ca.
3. Writing us at 262 Robert Street, Toronto, Ontario, M5S 2K8.

Appendix B – Response Form

Thank you for completing the Community Planning for Natural Hazards survey. Your response is important to us. Please fill out the information below, fold, and mail it back to John Newton Associates today.

Detailed results will be kept confidential. Community scores and your feedback will be used to measure how well communities are planning for hazards. Questions or comments? Contact John Newton at (416) 929-3621, or by email at j.newton@utoronto.ca.

1) Municipal Population _____

2) Region (*see map*) _____

3) Section Scores from "Grade Your Community" page

1 - ____ 2 - ____ 3 - ____ 4 - ____ 5 - ____ 6 - ____ 7 - ____ 8 - ____

4) Total score from Grade Your Community page _____

5) Has your community received any federal or provincial/territorial financial support after a disaster to repair public buildings or infrastructure? (*Mark all that apply*)

- ☐ Yes, within the last 5 years
- ☐ Yes, between 5 and 20 years ago
- ☐ Yes, more than 20 years ago
- ☐ Never
- ☐ Don't know

If yes, what natural hazard caused the disaster?

6) Does your community have a natural hazards mitigation program in place to reduce losses to future events?

- ☐ Yes
- ☐ No
- ☐ Don't Know

If yes, would you share your experience?

Name: Tel: (.....) -

7) How likely are you to make changes to your community plan based on the information in this questionnaire?

- ☐ Very likely
- ☐ Somewhat likely
- ☐ Somewhat unlikely
- ☐ Very unlikely
- ☐ Don't know

8) Please rate each of the following items, based on the degree to which they would help you incorporate natural hazards concerns into your community planning process.

Use a rating scale of:

1 = "A major help"; 2 = "A moderate help"; 3 = "A minor help"; 4 = "A minimal help";

5 = "No help"

- ☐ Federal, provincial/territorial or local legislative changes
- ☐ Additional funding
- ☐ Additional staffing
- ☐ Technical assistance
- ☐ Additional or improved mapping
- ☐ Additional or improved risk data
- ☐ Planning department priority
- ☐ Elected official priority
- ☐ Public demand for natural hazards planning
- ☐ Occurrence of a natural disaster in your community
- ☐ Prov/Terr-mandated comprehensive planning that includes natural hazards concerns
- ☐ Specific guidance on planning for natural hazards loss reduction
- ☐ Courses and training on natural hazards and planning
- ☐ General information on natural hazards and planning research and applications
- ☐ Other _____

Please provide comments on additional sheets.

9) Does your planning staff include a CIP member?

- ☐ Yes ☐ No ☐ Don't Know

10) Does your community have a full-time land use planner on staff?

- ☐ Yes ☐ No ☐ Don't Know

11) What is your community's exposure to natural hazards?

a) Please mark which of the following natural hazards your community has experienced; and,

b) Please *circle* the two (2) natural hazards of greatest concern to your community.

- | | | |
|--|--|---|
| ☐ Avalanche: Rock | ☐ Fog | ☐ Lightning: Electrical Disruption |
| ☐ Avalanche: Snow | ☐ Freezing Rain / Ice Storm | ☐ Lightning: Fire |
| ☐ Blizzard | ☐ Frost | ☐ Magnetic Storms (Sun Spots) |
| ☐ Cold Wave | ☐ Hail | ☐ Storm Surges |
| ☐ Drought | ☐ Heat Wave | ☐ Tornado |
| ☐ Dust Storm | ☐ High Winds (110+ kph) | ☐ Torrential / Heavy Rains |
| ☐ Earthquake | ☐ Hurricane/Typhoon | ☐ Tsunami (Tidal Wave) |
| ☐ Flood: Dam Burst | ☐ Land Subsidence /Liquefaction | ☐ Volcanic Activity |
| ☐ Flood: Flash | ☐ Landslide/Mudslide | ☐ Wildfire / Forest Fire / Smoke |
| ☐ Flood: Predictable/Seasonal | | |

12) Please notify me when the research results are available. ☐ No ☐ Yes, Your email:

.....

Appendix C – Analysis Tables

Table C-1 Analysis of Section Scores

Section	Statistical Characteristics			Average Score by Community Size				Average Score by Region			
	Range	Average	Median	<1000	1000 to 10 000	10 000 to 50 000	>50 000	NT	ET	CN	SW
1	0-7	4.5	5	3.0	3.8	4.4	5.2	3.1	4.4	4.9	4.7
2	0-7	4.3	5	2.3	3.6	4.2	5.4	3.3	3.9	5.1	4.4
3	0-9	5.3	5	3.9	5.1	5.4	5.8	4.1	5.1	5.7	5.6
4	0-8	4.8	5	3.4	5.0	4.7	5.0	3.9	5.5	5.1	4.8
5	0-7	4.0	4	3.1	4.0	3.7	4.5	3.4	4.2	4.2	4.2
6	0-5	2.4	3	1.6	1.8	2.7	2.8	1.5	2.2	2.8	2.6
7	0-7	3.6	4	2.6	3.3	3.6	4.1	2.6	4.1	3.9	3.7
8	0-6	2.0	2	1.1	1.9	2.2	2.3	1.6	2.2	2.3	2.1
Totals:	0-59	30.9	-	21.0	28.5	30.9	35.1	23.5	31.6	34.0	32.1
% of max:		52		36	48	52	59	40	54	58	54

Table C-2 Analysis of Total Score

Degree Community Planning Addresses Natural Hazards	Statistical Characteristics			Distribution by Community Size				Distribution by Region			
	#	Average	Median	<1000	1000 to 10 000	10 000 to 50 000	>50 000	NT	ET	CN	SW
Major	2	48	-	-	1	1	-	-	-	2	-
Moderate	18	41	40	1	3	3	11	1	3	5	9
Minor	50	31	31	2	16	18	14	8	8	18	16
Minimal	22	18	21	4	12	3	3	11	3	3	6
Totals:	92	-	-	7	32	25	28	20	14	28	31

Table C-3 Financial Support after a Disaster

Provision of Financial Support	Statistical Characteristics		Distribution by Community Size				Distribution by Region			
	#	%	<1000	1000 to 10 000	10 000 to 50 000	>50,000	NT	ET	CN	SW
Yes, within the last 5 years	13	14	1	4	5	3	1	8	2	2
Yes, between 5 and 20 years	5	5	0	4	1	0	2	0	0	3
Yes, more than 20 years ago	10	11	2	2	0	6	4	0	4	3
Never	26	28	2	15	3	3	5	3	11	7
Don't Know	40	43	2	11	12	16	16	2	5	17

Base = 94

Table C-4 Natural Hazards Mitigation Programs

Program in Place	Statistical Characteristics		Distribution by Community Size				Distribution by Region			
	#	%	<1000	1000 to 10 000	10,000 to 50,000	>50 000	NT	ET	CN	SW
Yes	13	14	1	2	3	7	2	0	5	6
No	60	64	6	26	18	10	17	12	12	19
Don't know	21	22	1	5	4	11	2	1	11	7

Base = 94

Table C-5 Likelihood of Changes to Community Planning Documents

Level of Likelihood	Statistical Characteristics		Distribution by Community Size				Distribution by Region			
	#	%	<1000	1000 to 10 000	10,000 to 50 000	>50,000	NT	ET	CN	SW
Very Likely	9	10	1	3	4	1	2	0	4	3
Somewhat Likely	35	37	4	12	9	10	12	5	6	12
Somewhat Unlikely	20	21	1	8	6	5	3	5	5	7
Very Unlikely	13	14	1	3	2	7	1	1	8	3
Don't Know	17	18	1	7	4	5	3	2	5	7

Base = 94

Table C-6 Areas of Assistance for Incorporating Natural Hazards into Community Planning Processes

Sources of Assistance	Statistical Characteristics			Average Rating ¹ by Community Size				Average Rating ¹ by Region			
	Rge	Avg	Med	<1000	1000 to 10 000	10 000 to 50 000	>50,000	NT	ET	CN	SW
Federal, provincial, territorial or local legislative changes	1-5	2.2	2	2.3	2.4	2.2	1.9	2.2	1.9	2.0	2.4
Additional funding	1-5	1.5	1	1.1	1.7	1.4	1.7	1.5	1.5	1.6	1.7
Additional staffing	1-5	2.0	1	1.5	2.3	1.6	2.3	1.9	1.9	2.4	1.9
Technical assistance	1-4	1.8	2	1.1	1.8	1.5	2.2	1.6	1.8	1.9	1.8
Additional or improved mapping	1-4	1.6	1	1.6	1.7	1.4	1.6	1.4	1.8	1.6	1.7
Additional or improved risk data	1-4	1.8	2	2.0	1.7	1.4	1.6	1.4	1.8	1.6	1.7
Planning department priority	1-5	2.3	2	1.5	2.6	2.2	2.3	2.2	2.2	2.8	2.1
Elected official priority	1-5	2.2	2	1.5	2.5	2.3	1.8	2.2	2.3	2.2	2.1
Public demand for natural hazards planning	1-5	2.3	2	1.9	2.4	2.6	2.1	2.4	3.0	2.4	2.0
Occurrence of a natural disaster in your community	1.5	2.1	2	2.3	2.3	2.2	1.6	2.4	3.3	1.8	1.7
Prov/Terr-mandated comprehensive planning includes natural hazards	1-5	2.2	2	2.4	2.1	2.2	2.1	2.1	2.4	2.2	2.0
Specific guidance on planning for natural hazard loss reduction	1-5	2.1	2	1.6	2.1	2.1	2.3	2.1	2.1	2.3	2.0
Courses and training on natural hazards & planning	1-5	2.2	2	1.8	2.1	2.0	2.6	1.9	1.8	2.7	2.0
General information on natural hazards & planning research & applications	1-5	2.4	2	1.9	2.3	2.2	2.8	2.3	2.0	2.7	2.3

¹ The scale used in 1=major help to 5=no help – See Appendix “B” Question 8 for more details

² Shaded areas represent “outliers” that are separated by 0.5 or more from the next average for that item.

³ Bold numbers show where the high-low range for an item is 1.0 or greater

Suggested areas of assistance added by respondents under “Other” included more senior government involvement (rated at 1 by a large central community).

Table C-7 Presence of Professional Planning Membership

Staff has MCIP Designation	Statistical Characteristics		Distribution by Community Size				Distribution by Region			
	#	%	<1000	1000 to 10 000	10 000 to 50 000	>50,000	NT	ET	CN	SW
Yes	67	71	2	13	24	28	7	8	26	26
No	27	29	6	20	1	0	14	5	2	6
Don't know	0	0	0	0	0	0	0	0	0	0

Base = 94

Table C-8 Tenure of Community Planning Staffing

Community has full-time planner(s)	Statistical Characteristics		Distribution by Community Size				Distribution by Region			
	#	%	<1000	1000 to 10 000	10 000 to 50 000	>50 000	NT	ET	CN	SW
Yes	67	71	1	16	22	28	10	8	24	25
No	27	29	7	17	3	0	11	5	4	7
Don't know	0	0	0	0	0	0	0	0	0	0

Base = 94

Table C-9 Perception of Exposure to Natural Hazards

Natural Hazard	Statistics		Occurrence by Community Size ¹				Occurrence by Region ²			
	#	% ¹	<100 0	1000 to 10 000	10 000 to 50 000	>50 000	NT	ET	CN	SW
Freezing Rain / Ice Storm	74	79	5	25	20	24	14	12	22	26
Blizzard	66	70	6	22	15	22	13	8	19	26
Flood: Predicable/Seasonal	63	67	5	12	22	24	8	10	22	23
High Winds (110+ kph)	56	60	5	19	15	17	9	10	17	20
Lightning: Electrical Disruption	55	59	6	17	13	19	11	6	21	17
Fog	49	52	3	14	15	17	7	6	14	22
Hail	46	49	3	13	13	17	8	4	13	21
Frost	42	45	2	12	13	15	8	4	13	17
Cold Wave	41	44	4	11	10	16	10	4	10	17
Heat Wave	39	41	3	10	8	18	6	3	12	18
Drought	35	37	2	10	11	12	2	9	5	19
Lightning: Fire	34	36	5	13	8	8	11	7	7	9
Torrential / Heavy Rains	34	36	4	7	9	14	5	2	13	14
Tornado	30	32	4	7	9	10	4	3	7	16
Wildfire/Forest Fire/Smoke	27	29	7	13	4	3	16	4	4	3
Flood: Flash	25	27	4	7	7	7	5	3	9	8
Flood: Dam Burst	18	19	3	8	3	4	6	5	6	1
Landslide/Mudslide	9	10	0	2	4	3	1	5	1	2
Earthquake	8	9	0	3	1	4	3	2	1	2
Storm Surges	7	7	0	1	3	2	2	2	0	3
Hurricane/Typhoon	7	7	0	3	0	4	0	0	5	2
Land Subsidence/Liquefaction	5	5	0	1	3	1	2	2	0	1
Dust Storm	1	1	0	1	0	0	0	0	0	1
Avalanche: Rock	0	0	0	0	0	0	0	0	0	0
Avalanche: Snow	0	0	0	0	0	0	0	0	0	0
Magnetic Storms (Sun Spots)	0	0	0	0	0	0	0	0	0	0
Tsunami (Tidal Wave)	0	0	0	0	0	0	0	0	0	0
Volcanic Activity	0	0	0	0	0	0	0	0	0	0

Base = 94

¹ % of base

² Shading indicates:  = >75% identified threat;  = >50% identified threat

Table C-10 Natural Hazards of Greatest Concern

Natural Hazard	Statistics		Occurrence by Community Size				Occurrence by Region			
	#	%	<1000	1000 to 10 000	10 000 to 50 000	>50 000	NT	ET	CN	SW
1. Flood: Predicable/Seasonal	29	31	1	5	12	11	2	5	12	10
2. Freezing Rain / Ice Storm	24	26	1	10	7	6	3	3	8	10
3. Blizzard	15	16	1	5	5	4	4	0	4	7
4. Flood: Flash	13	14	2	3	4	4	1	1	8	3
5. Tornado	11	12	1	3	4	3	0	0	2	9
6. Wildfire/Forest Fire/Smoke	10	11	4	4	1	1	7	2	1	0
7. Drought	6	6	0	2	2	2	0	1	1	4
8. High Winds (110+ kph)	4	4	0	3	0	1	2	0	1	1
9. Lightning: Electrical Disruption	4	4	1	3	0	0	2	1	1	0
10. Flood: Dam Burst	3	3	0	2	1	0	1	1	1	0
11. Heat Wave	3	3	0	1	0	2	0	0	2	1
12. Land Subsidence/Liquefaction	3	3	0	0	2	1	0	2	0	1
13. Lightning: Fire	2	2	1	1	0	0	1	0	0	1
14. Hurricane/Typhoon	1	1	0	0	0	1	0	0	0	1
15. Landslide/Mudslide	1	1	0	0	1	0	0	1	0	0
16. Storm Surges	1	1	0	0	0	1	0	0	0	1
17. Torrential / Heavy Rains	1	1	0	0	1	0	0	0	1	0

Base = 94

¹ Shading indicates: = a significant concentration of responses

Table C-11 Awareness and Promotional Opportunities Table

Organization	Opportunity
Association of Municipal Managers, Clerks & Treasurers of Ontario	• Include announcement in the <i>AMCTO Express</i>
Association of Municipalities of Ontario	• TBD
Canadian Centre of Emergency Preparedness	• Place announcement on Web site
Canadian Emergency Preparedness Association – Ontario Chapter	• Place announcement on Web site
Canadian Institute of Planners	• Place announcement in <i>Scenario Plan</i> • Place announcement on Web site • Place announcement/article in <i>Plan to Plan</i>, a publication aimed at Canadian planning students • Place on the agenda of the next Board meeting • Include an article in the Summer 2003 edition of <i>Plan Canada</i>, the CIP Journal
County Planning Directors	• Send an email announcement to members
Emergency Management Ontario	• Place announcement on Web site • Community and education officers will discuss the research during individual meetings about emergency management to be held with each Ontario municipalities in Sept/Oct
Federation of Canadian Municipalities	• Place announcement in FCM newsletter that goes out the 15th of each month • Place announcement on Web site
Institute of Catastrophic Loss Reduction	• None identified to date
Ministry of Municipal Affairs & Housing	• TBD
Natural Hazards Society	• Place a short article in the NHS Newsletter in summer 2003
Office of Critical Infrastructure Protection and Emergency Preparedness	• None identified to date
Ontario Association of Chief Planning Officials	• Send an email announcement to members • Raise at meeting in Fall 2002
Ontario Municipal Management Institute	• Place an announcement/article in <i>The Network</i> • Place announcement on Web site
Ontario Professional Planning Institute	• Place announcement in the Canadian Urban Institute Journal • Distribute research information for announcements at three OPPI district meetings • Place an announcement in the delegate packages at the OPPI Annual Conference in September • Speaker to raise research during presentation on emergency management
Regional & Single Tier CAOs of Ontario	• A heads-up was provide to attendees at a meeting the week of July 15th • Send an email announcement to all members
Regional Planning Commissioners of Ontario	• Discussed at meeting on July 19th

